

Work Order ID 72420

Monday, July 25, 2011 1:18:12 PM

Page 1

Item ID: D205-634-041

Accept

Setup Start

Revision ID:

Stop

Item Name: Replacement Skidtube

Start Date: 7/25/2011 Start Qty: 1.00

Cust Item ID:

Required Date: 8/11/2011 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan:

Date: 11-07-25

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

Draw Nbr

Revision Nbr

D2580-041

Rev.D DEO-D1

100

0.00



DC

DOCUMENT CONTROL

Memo

0.00

Document Control

Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG002

N/A

110

0.00



CNC Bend I

BENDING MACHINE - SKIDTUBES

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio 16

2-Cut tubes as per Dwg. D2580

3- scribe batch# in aft end of tube

1 20 BE11/08/03

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Stop

Sequence ID/
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DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

120

0.00



Skidtubes

Memo

0.00

Skidtubes

1- Deburr ends and remove bending marks

2- Prepare tube for welding as per QSI 004

Sh
u/00/03

130

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

S u/08/06

W/O:		WORK ORDER CHANGES					
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Sequence ID/
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DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

140

0.00



Skidtubes

Skidtubes

Memo

0.00

1-Weld step D2576 as per Dwg. D2580 and QSI004

A/R□□□ Aluminum Rod

M15778 BE 11/08/08

2-Grind welds on step as per Dwg D2580

3-Weld spacers as per dwg D2580

BE 11/08/08 A/R M15778

3- *** N/A**** Insert D4202-1 spacer, swage as per QSI002 and trim/ grind flush per QSI002 and dwg. Hold x-bolt with DT9701 Use tube expander 1/2 x 17G to start expansion and finish with 1/2 x 18G to achieve dwg dimension.

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64", adjust stopper not to hit web. Deburr

} OL 11/08/10.

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Deburr

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Deburr

BE 11/08/12

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
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DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00



Powdercoat

Powder Coating

Memo

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

9:00
320
9:30

X ϕ M-11/08/18

190

QC3- Inspect Part Finish

0.00



QC

Quality Control

Memo

0.00

i ϕ M-11/08/22

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Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200

0.00



HandFinish

Hand Finishing

Memo

0.00

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of

Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291 ☐ 111125 ☐ 6Sikaflex expire date: 15/01

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with

Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291 ☐ 111125 ☐ 6Sikaflex expire date: 15/01

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch: 11183131 6 11/08/22

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

8/10/23

⑩

Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for
Foreign objects per QSI 024

220



Packaging

Packaging

Packaging

0.00

Memo

0.00

RP 72285

11/8/238

Identify and pack for shipping as per PPPD205-634-041
Location: _____
PPP Rev: _____

230



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

11/8/238

MF

11-08-23

W/O:		WORK ORDER CHANGES					
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Page 1

Work Order ID: 72420

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 7/25/2011

Required Date: 8/11/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30
KJ IPP Rev P 10.02.19
per PAR09-043 EC verified by:DD
IPP Rev. O 06.02.28 Added paperwork EC
IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM IPP Rev:Q
10.12.01 as per chg003 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D4202-1- Spacer	D2579	Manufactured	No			140	Each	443.0000	20	20			BE 10/8/08 372/99 *20
--------------------	-------	--------------	----	--	--	-----	------	----------	----	----	--	--	--------------------------

Location	Loc Qty	Loc Code
LG002	443	
66929	106	
67129	196	
67308	1	
67430	140	

D2580-1 205 Skidtube bent detail		Manufactured	No			110	Each	4.0000	1	1			BE 11/08/03 72460 1
-------------------------------------	--	--------------	----	--	--	-----	------	--------	---	---	--	--	------------------------

Location	Loc Qty	Loc Code
LG	4	
71014	2	
71784	2	

D2576-3 Step (maching detail)		Manufactured	No			140	Each	42.0000	1	1			BE 11/08/08
----------------------------------	--	--------------	----	--	--	-----	------	---------	---	---	--	--	-------------

Location	Loc Qty	Loc Code
LG	42	
66156	42	

W/O:		WORK ORDER CHANGES					
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Page 2

Work Order ID: 72420

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 7/25/2011

Required Date: 8/11/2011

Start Qty: 1.00

Required Qty: 1.00

D2855

Manufactured No

200

Each

37.0000

1

1



Cap



11/08/22

Location

Loc Qty

Loc Code

FP007

37

53791

2

65519

2

65569

33

X1

AN3-5A

Purchased

No

200

Each

1,048.000

2

2



Bolt



11/08/22

Location

Loc Qty

Loc Code

ST350

1048

115371

275

117423

773

X2

AN960JD10L

NAS1149D0332J

Purchased

No

200

Each

0.0000

2

2



Washer

117087



(x2) 11/08/22

ALS7-1032-130

Purchased

No

200

Each

1,861.000

50

50



Insert



11/08/22

Location

Loc Qty

Loc Code

ST282

1861

117717

899

118386

962

118237

X30

Monday, July 25, 2011 1:18:19 PM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Work Order ID: 72420

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 7/25/2011

Required Date: 8/11/2011

Start Qty: 1.00

Required Qty: 1.00

AN3C4A Purchased No 200 Each 1,333.000 50 50
BOLT

Location

Loc Qty

Loc Code

ST350

1333

117313

2

117688

269

117795

500

117872

22

118012

500

118112

40

M118628

x50

AN960C10L NAS1149C0332 Purchased No

200 Each 0.0000 50 50



washer

D3566-13

Manufactured No

200 Each 35.0000 1 1



Gasket

Location

Loc Qty

Loc Code

FP

16

69281

16

FP014

19

68341

1

72149

18

D3566-5 Manufactured No

200 Each 18.0000 1 1



Gasket

Location

Loc Qty

Loc Code

FP015

18

68961

6

71601

12

x1

Monday, July 25, 2011 1:18:19 PM

Shop Packet Print

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Parent Item Name: Replacement Skidtube

Start Date: 7/25/2011

Required Date: 8/11/2011

Start Qty: 1.00

Required Qty: 1.00

D3566-1

Manufactured No

200

Each

24.0000

2

2



Gasket



Handwritten: 11/08/22

Location

Loc Qty

Loc Code

FP011

22

70769

10

71580

12

FP015

2

68924

2

1372848

Handwritten: 12

D3564-11

Manufactured No

200

Each

12.0000

1

1



Wearshoe



Handwritten: 11/08/22

Location

Loc Qty

Loc Code

FP019

12

67591

12

Handwritten: 11

D3564-13

Manufactured No

200

Each

20.0000

1

1



Wearshoe



Handwritten: 11/08/22

Location

Loc Qty

Loc Code

FP016

9

69280

9

Handwritten: 11

FP017

11

71594

11

D3564-9

Manufactured No

200

Each

14.0000

1

1



Wearshoe



Handwritten: 11/08/22

Location

Loc Qty

Loc Code

FP019

14

67590

4

69943

10

1372208

Handwritten: 11

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Start Date: 7/25/2011

Required Date: 8/11/2011

Start Qty: 1.00

Required Qty: 1.00

D3564-5

Manufactured No

200 Each

16.0000

1

1



Wearshoe



11/08/22

Location

Loc Qty

Loc Code

FG

2

34806

2

FP019

14

70864

14

D2594-3

Manufactured No

200 Each

740.0000

16

16



O-Ring, 205 Skidtube



11/08/22

Location

Loc Qty

Loc Code

FP-A

740

65518

54

66952

686

D2594-1

Manufactured No

200 Each

201.0000

16

16



Plug, 205 Skidtube



11/08/22

Location

Loc Qty

Loc Code

FP-A

201

42807

28

67441

7

68943

166

11/08/22

W/O:		WORK ORDER CHANGES					
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DESIGN <i>[Signature]</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS; INCLUDE DEO 9124/9183	

RELEASED
07.06.28 *[Signature]*

DEO ATTACHED
UNDER REVIEW

[Signature]
RMV *[Signature]*

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. *2420*

110725

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
SEE NOTES ON
PAGE 2 FOR D2580-041 AND
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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RELEASED
07-06-28

~~DEO ATTACHED~~

RMV 4/11.06.30

#0.208

DRILL PRIOR TO D2855 CAP
INSTALLATION (2 PLACES)

ANJ-5A BOLT (1)

AN960D10L WASHER (1)
(2 PLACES)

D2855 CAP

SEAL WITH
SIKAFLEX-241/-291

0.40

DETAIL C
SCALE 5:24

SECTION D-D
SCALE 5:24

02579 SPACER-

D2596 WEB (REF)

5 ALS7-1032-130 (REF)
(TYP 50 PLACES)

AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP

D2580-041 NOTES

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

D2580-1 DRILLING DETAIL

37.50
DISTANCE TO AFT END
OF D2596 WEB
3 7
1.750 1.750
#0.508 (TYP.)
(40 PLACES)
REFER TO DETAIL A
8.750
17.375
26.000
34.188
57.313 (REF)
7 EQUAL SPACES
8.188 PITCH
38.0
190.0
(D2500-1)

D2580-1 BENDING AND CUTTING DETAIL

Technical drawing of a bridge deck cross-section. The drawing shows a horizontal line representing the deck surface, with a vertical line indicating the centerline. Key dimensions and labels include:

- A vertical dimension of 1.4 on the left side.
- A horizontal dimension of 13.4 from the left edge to the centerline.
- A horizontal dimension of 1.0 labeled "DISTANCE BETWEEN HOLE AND TANGENT POINT" on the left side.
- A horizontal dimension of 32.0 ± 1.0 from the centerline to the right edge.
- A horizontal dimension of 1.0 labeled "DISTANCE BETWEEN HOLE AND TANGENT POINT" on the right side.
- A horizontal dimension of 20.0 from the centerline to a point on the right side.
- A vertical dimension of 11 on the right side.
- A label "4" in a triangle pointing to the top of the deck on both sides.
- A label "Ø0.640" indicating a hole diameter.

D2580-041 ASSEMBLY DETAIL

0.5

1.5

1.5

0.5

1.5

1.5

1.5

8

BLACK ANTI-SKID TO 0.5 ABOVE LOCATION RIDGE

BLACK ANTI-SKID TOP OF STEP TO 0.5 ABOVE BOTTOM EDGE

WELD AS PER DETAIL 8

REFER TO DETAIL C

D3566-1

D3566-5

D3566-1

D3566-13

D3564-11

D3564-5

D3564-9

D3564-13

AN3C4A BOLT (1)

AN860C10L WASHER (1)

(50 PLACES)

DESIGN

DRAWN BY

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DESIGN

1.

CHECKED

CHECKRE

DATE

07.02

DRAWN BY

ALL

APPROVED

APPROVED *[Signature]*

7

1

DART

DART AEROSPACE LTD.
HAWKESBURY, ONTARIO, CANADA

	[REDACTED]
	BOARDING NO.

DRAWING NO.
00500

02580

TITLE	
-------	--

205 SK

25

RE

SHEET 2 OF 2

50

ASSEMBLY

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

11.06.30
ZmV 0011.06.30

D2580-1 DRILLING DETAIL

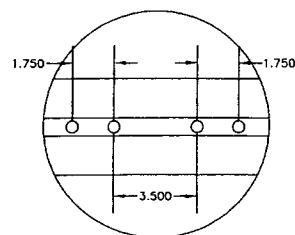
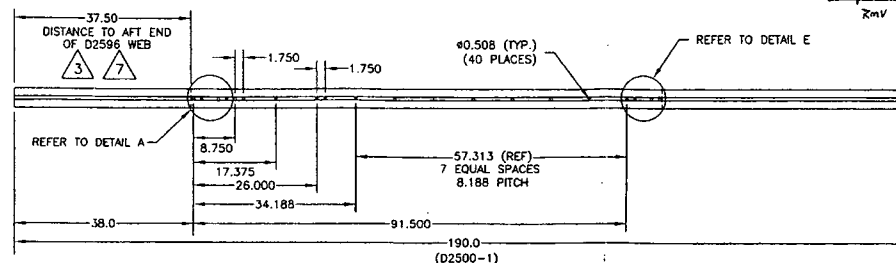


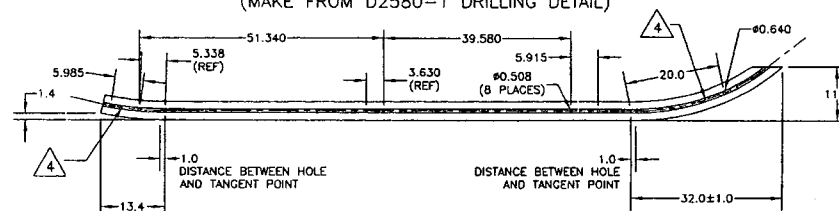
Diagram illustrating the grinding locations for the propeller cross-section. The diagram shows a cross-section of a propeller with the following labels and features:

- GRIND FLUSH (4 PLACES)**: Indicated by four small circles on the propeller's surface.
- GRIND FLUSH**: Indicated by a small circle on the propeller's surface.
- D2576-3 STEP**: Indicated by a line on the propeller's surface.
- LOCATION RIDGE ON UNDERSIDE OF D2576**: Indicated by a line on the underside of the propeller.

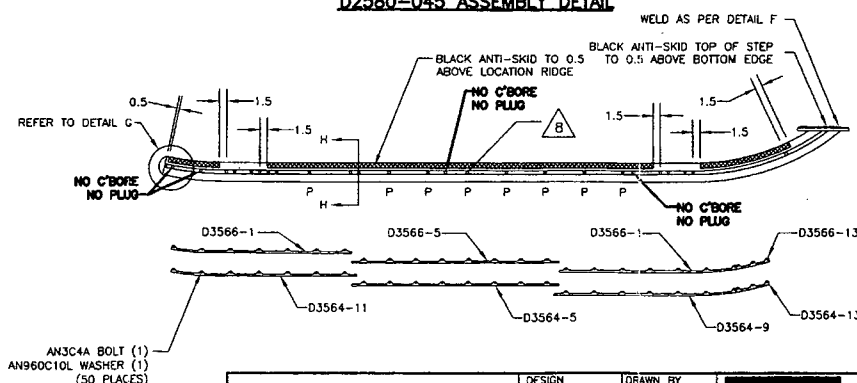
RELEASED
07-06-78



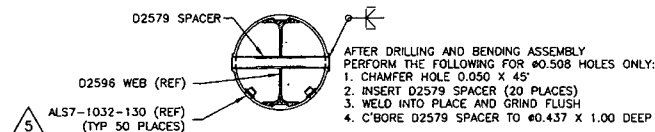
D2580-5 BENDING AND CUTTING DETAIL
(MAKE FROM D2580-1 DRILLING DETAIL)



D2580-045 ASSEMBLY DETAIL



SECTION H-H
SCALE 5:24



D2580-045 NOTES

- i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE
WITH THE SPACER AT THIS LOCATION

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CHECKED BY:

APPROVED.

DATE _____

DART

DART AEROSPACE LTD.
HAWKESBURY, ONTARIO, CANADA

	DRAWING NO.
--	-------------

REV. 0

TITLE

SCALE

205 SKIDTUBE ASSEMBLY

1-24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NO. 262

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliott
Job number: B 71946
Part number: D205 634 041
Description: 205
Welding Process: Tig ☒ Mig ☐
Base material: Aluminum
Current: AC ☒ DC ☐

TEST REQUIREMENTS AND RESULTS

Visual: pass ☒ fail ☐
Penetration: pass ☒ fail ☐

UNACCEPTABLE

Cracks: pass ☒ fail ☐
Undercut: pass ☒ fail ☐
Pin holes: pass ☒ fail ☐
Overlap (cold lap): pass ☒ fail ☐
Porosity (surface): pass ☒ fail ☐
Coloration: pass ☒ fail ☐

Qualifier Barclay Elliott Date of Test Coupon 11-08-11
Welder Barclay Elliott Date of Test Coupon 11-08-11

The above named individual is qualified in accordance with AWS D17.1.2001 to weld